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09/295,958

04/21/1999

Richard C. Adams

79628

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04/19/2005

COMMANDING OFFICER
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EXAMINER

CAO, HUEDUNG X

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/295,958

Applicant(s)

ADAMS ET AL.

Examiner

Huedung X. Cao

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-46 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 10-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>04/21/99</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over BOHLMAN et al. (5,227,807) in view of YING (6, 166,694).

As per claim 1, Bohlman teaches the claimed "antenna apparatus" comprising:

"first and second linearly polarized conductor-backed spiral antennas" (Bohlman, the spiral antennas 14 and 20; figure 1) wherein said antennas both simultaneously transmit or both simultaneously receive on substantially the same frequencies, wherein said antennas are spaced from each other (Bohlman, column 6, line 41 to column 7, line 57) and further wherein each of said antennas comprises:

"a substrate having first and second flat, opposite, sides" (Bohlman, the dielectric plate 32; column 4, lines 51-56);

"a pair of spiral antenna elements disposed on said first side of said substrate in which each of said elements has a corresponding feed point" (Bohlma, the spiral antennas 14 and 20 with the corresponding feed points;

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figure 1); "wherein said first antenna and said second antenna are oriented so that an imaginary line drawn through said feed points corresponding to said first antenna does not coincide with an imaginary line drawn through said feed points corresponding to said second antenna" (Bohlman, the imaginary lines through feed points of the antennas 14 and 20 showed in figure 1 are not coincided).

It is noted that Bohlman does not teach "a conducting ground plane disposed on said second side of said substrate". However, Ying teaches that such "a conducting ground plane disposed on said second side of said substrate" is well known in the art (Ying, the grounded post 335; column 4, lines 50-65). It would have been obvious to arrange the ground plane on other side of the substrate because it provides a compact form of the printed circuit being occupied small space (Bohlman, column 4, lines 51-58).

Claim 2 adds into claim 1 "said antennas are spaced vertically to radiate substantially parallel" (Bohlma, column 7, lines 46-57).

Claim 3 adds into claim 1 "said imaginary line drawn through said feed points corresponding to said first antenna is orthogonal to said imaginary line drawn through said feed points corresponding to said second antenna" (Bohlman, the imaginary lines through feed points of the antennas 14 and 20 showed in figure 1 are orthogonal; Bohlman, column 6, line 41 to column 7, line 57).

Claim 4 adds into claim 1 "said spiral elements take the form of an Archimedean spiral" (Bohlman, column 4, lines 34-50).

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Claim 5 adds into claim 1 "a metal foil" (Bohlman, the thin conductive metal film 12; column 4, lines 51-56).

Claim 6 adds into claim 1 "said antenna elements of said first and second antennas are mounted in a common plane" (Bohlman, the plate 12; column 4, lines 12-20).

Claim 7 adds into claim 1 "said substrate has a dielectric constant of approximately 1" which the cited references do not teach. However, Bohlman's dielectric plate 32 (column 4, lines 51-58) could have a dielectric constant of approximately 1 because it provides an appropriated input impedance matching circuit to transmitted or received signals.

Claim 8 adds into claim 7 "said substrate comprises a dielectric of DIVINYCELL (trademark) which the cited references do not teach. However, Bohlman's dielectric plate 32 (column 4, lines 51-58) could have a dielectric constant of DIVINYCELL because it provides an appropriated input impedance matching circuit to transmitted or received signals.

Claim 9 adds into claim 1 "said first and second antennas share a common conducting ground plane" which the cited references do not teach. However, the shared conductive plate 12 containing two antennas 14 and 20 (Bohlman, figure 1) suggests a share of ground plate because it provides a compact form of the printed circuit being occupied small space (Bohlman, column 4, lines 51-58).

Allowable Subject Matter

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3. Claim 10, and its dependent claims 11-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Prior Art fail to teach that the performance of each of said antennas can be described by an axial ratio defined as the difference between vertical gain and horizontal gain at a particular frequency and wherein said axial ratio varies by no less than plus or minus 5 dB.

4. Claims 21-46 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art made of record fails to anticipate or make obvious the claimed invention. Specifically, the prior art fails to teach, in combination with the remaining elements as recited in claims 21, and 34:

Regarding to claims 21, and 34, Prior Art fail to teach that a pair of spiral antenna elements disposed on said first side of said substrate in which each of said elements has a corresponding feed point, and said spiral antenna elements making at least three 360 degree turns; a conducting ground plane disposed on said second side of said substrate, wherein said substrate separates said spiral antenna elements from said conducting ground plane by a distance that no greater than 6 inches.

Claims 22-33 are allowed for depending on claim 21.

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Claims 35-46 are allowed for depending on claim 34.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Inquiries

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Huedung Cao
Patent Examiner